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Research Article

Study of Integrated Ticketing Systems in Banyuwangi Tourism Destinations

Ayu Wanda Febrian[1]*, Masetya Mukti[1], Rudi Tri Handoko[1], and Muhamad Ari Perdana[2]

[1]Tourism Business Management, Banyuwangi State Polytechnic, Banyuwangi, Indonesia
[2]Tourism Destination, Banyuwangi State Polytechnic, Banyuwangi, Indonesia

ORCID
Ayu Wanda Febrian: https://orcid.org/0009-0007-1489-3208
Masetya Mukti: https://orcid.org/0009-0004-0930-4278
Muhamad Ari Perdana: https://orcid.org/0009-0005-4339-215X

Abstract.
The absence of an integrated system between tourist attractions, accessibility points, and accommodations is affecting the variation in tourist visit data received by each tourism-related agency in Banyuwangi regency. This research aims to examine the most effective and efficient integrated ticketing system that Banyuwangi Regency Government can immediately adopt, to collect and compile accurate tourist visit data from the tourist attractions, accessibility, and accommodation in Banyuwangi. The design of this research used descriptive qualitative with a meta-analysis approach. The result of this research shows that the Banyuwangi Regency Government has attempted to create mobile applications to realize tourism marketing programs and facilitate data collection of tourist visits, namely the “Banyuwangi Tourism” and “Banyuwangi E-Ticketing” applications. To minimize data collection on the number of repeated tourist visits at each tourist attraction visited, these two applications can be integrated and developed further by implementing integrated payment via QR Code where the Banyuwangi Tourism application can also function as a payment medium to scan barcodes provided in the management of tourist attractions through the “E-Ticketing Banyuwangi” application to fulfill the purpose of integrated data.

Keywords: integrated system, tourism data, QR code, ticket system, tourism destination

Corresponding Author: Ayu Wanda Febrian; email: ayuwanda@poliwangi.ac.id

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1. Introduction

In 2022, research was completed with the title “Strategy for Optimizing Local Taxes in the tourism sector to Increase the local revenue of Banyuwangi District”. When collecting data during the FGD implementation, a new phenomenon emerged, namely the difference in data owned by each relevant agency that carried out regional tax collection [1]. Starting from the Regional Revenue Agency, the Regional Development Planning Agency, and the Tourism Office, to the Banyuwangi Regional House of Representatives, data on the number of tourists visiting Banyuwangi is different. This certainly has an impact on the accuracy of regional income from the tourism sector.

The absence of an integrated system between attractions, accessibility, and even tourist accommodation is the main reason for differences in the data received by each agency. The finding that occurs is that one person's data can be counted multiple times in several attractions. An example can be taken, from a tourist named "Joko" who came to Banyuwangi. Joko visited Pulau Merah Beach and Boom Beach and stayed at the Aston Banyuwangi Hotel. It was recorded that Joko counted 3 (three) people. This is because Pulau Merah Beach has data for 1 person, Boom Beach has data for 1 person, and Hotel Aston reports data for 1 person so that the recapitulation data owned by the Tourism Office is only calculated from the accumulated number of tourists from each tourist attraction. The data received by the Regional Revenue Service was only 1 obtained from the Aston Banyuwangi Hotel.

The trace data on tourist arrivals is still quite difficult to trace because there is no integrated system. This of course will have an impact on the tax calculation bias. Meanwhile, what is most echoed by the Tourism Office is the arrival of tourists who have increased significantly every year but the fact is that this is not matched by the addition of an increase in the area from the large number of tourist arrivals.

When we met in a discussion forum on tax maximization [2], we found that the main phenomenon was the problem of a ticket data collection system that had not been integrated. An integrated system is a series of processes to connect several computerized systems and application software both physically and functionally [3]. So far, Banyuwangi has not adopted or created an integrated ticketing system which has resulted in data for each agency and tourist attraction not being in sync with one another.

There are several systems used to update data, ranging from manual, and website-based, to even using sophisticated applications using only a barcode scan. Banyuwangi still needs a more in-depth study related to the use of an integrated ticket system. It is not arbitrary to adopt products from other regions or companies. This is because cases from one location to another are different. The process of development a new integrated ticketing system needs an organization that have functions to provide the ticketing systems, managing the system with integrate the pricing system and media as tickets, and collection of fee and distribution of revenue. This is can be achieved by developing an organization as clearing center and standardized tickets media, fare collection and system of ticketing to create an integrated ticketing system [4].

With this in mind, it is important to carry out research related to the study of the integrated ticketing system for Banyuwangi Tourism Destinations through meta-analysis. The result to be expected from this research is a preliminary scientific study on the

description and type of the most effective and efficient integrated ticketing system that can be immediately adopted or made by Banyuwangi. The goal is that accurate data results can be useful for strengthening regional income and or Banyuwangi tourism development strategies.

2. Literature Review

This research refers more to research which discusses tourist e-tickets visiting Karangasem, Bali [5]. This is because the topic of discussion and the object under study are the same, namely related to data on tourist visits. Meanwhile, the method approach is different, which is more inclined to use research with meta-analysis [6]. This analysis is used to facilitate this research in evaluating the results of previous studies that discuss integrated ticketing systems [7]. Furthermore, other research is used as a support for this research study which of course requires a lot of secondary data to evaluate and find the best studies related to the issues raised. This study also refers to several concepts and theories that include: (a) Tourism destinations and tourist attractions in Law 10 of 2009 concerning Tourism, (b) Tourist attraction from Government Regulation Number 50 of 2011 concerning the National Tourism Development Master Plan 2010 – 2025. The integrated ticketing system is a tool for implementing pricing policies with operational, commercial, and social objectives in mind. The ticket system is the translation of fares into a concrete means of payment for passengers and fees to operators [8].

3. Methods

The design of this research is descriptive qualitative with a meta-analysis approach. The descriptive research method in this study is intended to explore various data and information regarding (1) management or management of tourist tickets that have been carried out so far by Banyuwangi tourism destinations; (2) internal and external factors that can affect the current ticketing system; (3) case studies through secondary data from the management of tourist tickets in other tourism destinations. The results of the collected data and information will be used as a basis for studying the integrated ticketing system in Banyuwangi.

The data analysis method used in this study uses meta-analysis. A meta-analysis is a form of research that focuses on a secondary analysis of research results that are of interest to researchers through several books or reference sources [9]. This grouping

can categorize meta-research as evaluation research, because researchers do not have to go directly to the field and conduct research but simply collect data and research results that already exist, can carry out analysis, and can report the results of the study.

Meta-analysis is a form of synthesis of several studies that focus on the results found in these studies [10]. Meta-analysis can integrate findings from several studies to reveal patterns of relationships that underlie the research literature, thereby providing a basis for theory development [11]. There are 5 (five) steps in carrying out this research through a meta-analysis approach [10], namely:

a. Formulate research problems. This first step is used by researchers for the preparation stage.

b. Collect literature material by selecting articles or research results that are by the desired goals. The second step is to select secondary data to be used in the research discussion

c. Evaluate the research to find additional information. Evaluate as needed.

d. Perform analysis and interpretation of the literature. This fourth step is more focused on identifying and analyzing internal and external factors related to the integrated ticketing system according to the data collected.

e. Presenting the results of the meta-analysis in written form. In this final stage, the results of research related to the study of an integrated ticket system that can be adopted for use by Banyuwangi tourism destinations have been presented.

4. Results and Discussion

Banyuwangi Regency has natural resources that are starting to be visited by tourists, both domestic and foreign tourists. This natural wealth is the main attraction for the development of Banyuwangi tourism. Banyuwangi's leading tourist attraction is called the Triangle of Diamond Banyuwangi. The three diamond destinations include the Mount Ijen Area, Plengkung Beach Area, and Sukamade Beach Area [12].

To support tourism development, Banyuwangi has a special agency that oversees the tourism sector, namely the Banyuwangi Culture and Tourism Office. Starting from planners, and executors, to evaluating tourism, they are the main duties and functions of the agency. One of the resulting products is data on tourist visits to Banyuwangi. The data is usually used for Banyuwangi tourism management. The findings that are quite confusing are the differences in the data presented between the Banyuwangi Local

Government (Figure 1) and the Banyuwangi BPS (Figure 2), even though the sources for both are from the Department of Culture and Tourism.

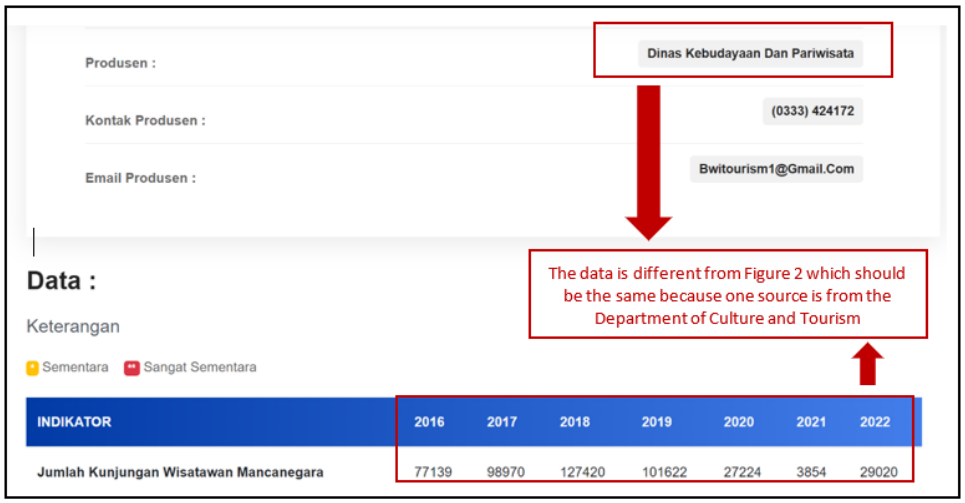

Figure 1: Number of foreign tourist visits Banyuwangi www.banyuwangi.kab version.

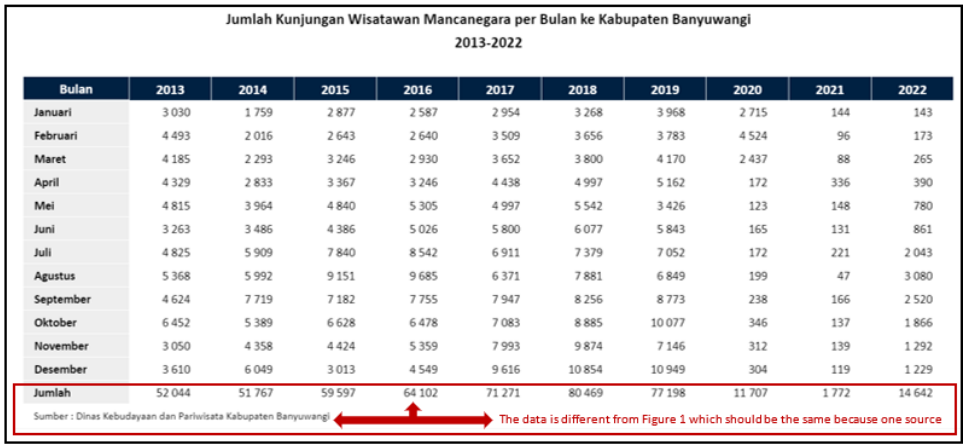

Figure 2: Number of foreign tourist Visits Banyuwangi version www.banyuwangi.bps.go.id

The two figures include the Culture and Tourism Office of Banyuwangi as the source or producer of the data on the number of visits, meaning that what makes the data the same, but what is unique is that the presentation of the data is different. For example, Figure 1 from the Banyuwangi Regional Government website states that in 2016 the number of foreign tourist arrivals reached 77,139, while in Figure 2 from the BPS website, the number was less, namely 64,102, and so nothing will be the same until 2022. When this difference is confirmed, The Department of Culture and Tourism admits that there are differences in calculations between one agency and another. So it depends on which agency needs to be reported. This is also the same when asked by the Banyuwangi Regional Revenue Agency, the data received regarding the number of visits is different from the two pictures. The reason is that there is no integrated standard system between

one tourist attraction and another. So what happens is the accumulation of all visitors, this will affect the regional income bias. If many visit, it is not directly proportional to regional revenues through tax collection.

This problem has been felt until now and has not found the best formula to overcome it. Through meta-analysis, the following presented the results of analysis from previous studies that have been carried out in data integration efforts (Table 1):

Table 1: Strengths and weaknesses of previous research on integrated data.

No	Research Article Description	Advantages	Disadvantages
1	**Title:** Integrated Ticketing System of Public Transport in Jakarta vs. Varmland Sweden **References:** [4] **Research methods:** Quantitative **Result:** One of the attributes of public transportation services is the ticketing system, which is currently the system not yet integrated and still requires service improvement. Therefore, the development of a ticketing system into an integrated ticketing system is needed to make public transportation competitive and attractive to users of transportation services. In addition, the preparation of this research also uses the case from Värmlandstrafik AB as a comparative study and the New Services Development theory as an approach to provide an assessment of the possibility of implementing an integrated ticketing system.	The ticketing system is an integrated data development involving many parties. The success of this concept can synergize several related parties. As a comparison with DKI Jakarta, this integrated ticketing system has been successfully implemented in Varmland, Sweden's public transportation. So only one card is needed for one payment for all public transportation including trains and buses since 1990. Then DKI Jakarta was adopted in 2007 which started from paying for public transportation until developing in 2023 it can be used as an entrance ticket to tourist attractions managed by the government (cnnindoneia.com, 2023). Supports the use of cashless or cashless payment systems. The use of this integrated system is also considered more practical and flexible in its implementation.	The development of a ticketing system requires an organization or company that focuses on providing, managing, collecting fees, and distributing revenue as an integration center, namely PT Bank DKI as an e-ticketing provider. Requires joint commitment from each organization/agency/company to develop a system which usually tends to be challenging to put together because it involves many different interests. Purchasing a JakCard card tends to be free because consumers don't need to include an identity at the first purchase. It would be difficult to sift through user data and change hands very quickly.
2	**Title:** Development of an Integrated E-Ticket Mobile Tourism Information System with the Extreme Programming Method (Case Study of the Karangasem Tourism Office) **References:** [5] **Research methods:** Qualitative descriptive and sensitivity test **Result:** Karangasem Regency is one of the regencies in Bali which has many tourist attractions, which is an area that is quite frequently visited by tourists. However, data collection on tourist attractions by the Tourism Office is still done conventionally, so employees and time are needed to collect data on tickets for tourist attractions. For this reason, the development of an "Integrated Tourism Information System for E-Ticket Mobile with the Extreme Programming Method" was carried out. The Extreme Programming method is a method that prioritizes speed so it is very suitable for use.	E-tickets are presented to make it easier for managers to report sales results to related parties, namely the Karangasem Tourism Office Facilitates the manager's work because there is no need to manually sell tickets which risks incorrect ticket recapitulation	Not yet available for tourists, only limited to managers Requires an internet network to run the application Requires additional memory space to install applications on smartphones Only focus on calculating ticket sales, not yet focusing on tourist data

Table 1: Continued.

No	Research Article Description	Advantages	Disadvantages
3	**Title:** *Smart Integrated Payment System for Public Transportation in Jakarta* **References:** [13] **Research methods:** Qualitative descriptive **Result:** The user's integrated payment system simply opens the application and scans the QR code printed on public transport by adding to the balance in the account. The proposed system has advantages and attractive features, namely efficiency. Nowadays people like to carry smartphones anywhere and anytime, this e-wallet system is efficient because users only need to open their smartphone to open the application and scan the QR code, and the money saved will be deducted automatically. Users can also get promos and discounts to pay for public transportation by simply entering a promo code. Businesses partnered with also benefit that free advertising from the system.	Provide references on problem-solving methods related to technology products that can track the number and whereabouts of migrants to a new place A payment system that utilizes a smartphone, because nowadays everyone is considered to have a smartphone, making it easier to do a QR Code QR Codes are easy to create and easy to access using QR readers, even the latest smartphones are equipped with QR readers without additional applications. The user simply opens the camera and the system automatically reads it QR Code can generate required data such as username, money balance in internet accounts, and payments made A reward system that provides benefits for users with a system of points/discounts Additional benefits in the form of advertising from partners in the application	Integrated internet network because this system requires internet network availability
4	**Title:** *E-Payment Transactions Using Encrypted QR Codes* **References:** [14] **Research methods:** *Comparison Methode* **Result:** QR Code is used in online shopping electronic payment systems. This provides customer data privacy and prevents misuse of customer personal data. This method is primarily concerned with identity theft prevention and customer data security. This is compared to other banking applications such as credit or debit cards, and transaction passwords, QR Code is considered more efficient and faster in use. This scenario in mobile payments addresses the problem of transaction speed and security, without complicating the process with the help of a QR Code.	When compared to the physical payment method in the form of a card, the QR Code method is considered more effective and efficient Prevention of data theft and misuse is more difficult than physical systems using cards Can be adopted by several other fields, not only by the banking sector	Requires internet network in system application Requires data reduction when used for single data collection

Table 1: Continued.

No	Research Article Description	Advantages	Disadvantages
5	**Title:** *Making a Ticket Sales Data Processing Application for the Regional Technical Implementation Unit for Natural Tourism Objects with Lake Attractions in Garut Regency* **References:** [15] **Research methods:** *Java and MySQL program* **Result:** The business process of processing ticket sales data at the Garut Tourism Object in particular Lake tourism objects still use a system of recording and storing files online manually, so there is a considerable risk of errors in the data processing. This study makes a ticket sales application, using an object-oriented design system, namely the Unified Approach (UA) which consists of the stages of Object Oriented Analysis (OOA) and Object Oriented Design (OOD), and to model the system requirements, the Unified Modeling Language is used. (UML).	The use of the Ticket Sales Data Processing Application is expected to help facilitate data processing, generate reports, speed up the data search process, and help secure data from damage or data loss	Requires an internet network to run the application Requires additional memory space to install applications on smartphones Only focus on calculating ticket sales, not yet focusing on tourist data
6	**Title:** *Covid-19 Contact Trace App Deployments: Learnings From Australia and Singapore* **References:** [16] **Research methods:** *Comparison Methode* **Result:** The Covid-19 pandemic hit countries around the world. Technology by utilizing smartphones has been proposed as a way to reduce the risks posed to humans. If health authorities and governments can track citizens' movements at the most granular level, and verify with whom they have contact, then they can respond immediately to quarantine policies. Thus, as much as possible to minimize the level of exposure to disease, especially in densely populated areas, so that before a potential outbreak occurs, the spread of the virus has been limited.	Utilizing applications to collect user data The presence and visits of each user can be detected	Need to use internet network for its use Requires discipline from officers to ensure users report their visits Can only be used for those who have a smartphone

Table 1: Continued.

No	Research Article Description	Advantages	Disadvantages
7	**Title:** *Model of Information Systems Success Delone and Mclean in using Pedulilindungi application in the tourism sector of Malang City* **References:** [17] **Research methods:** *Multiple linear regression* **Result:** Epidemiology experts have also warned to be vigilant against the third wave of COVID-19, as a result, applications are urgently needed who are fast in providing information about COVID-19. The purpose of this study is to see from the point of view of the use of the Peduli Lindungi application system on the visitor side of existing destinations by looking at how the quality system, information quality, and service quality in the application, especially visitors to the tourism sector in Malang City.	Using the PeduliLindungi application makes it easier for visitors to a location by simply scanning a barcode using the QR Code method Scanning the QR code will make it easier for the government to detect and monitor The PeduliLindungi application is very useful for finding out our history of traveling or making visits to any public service access, when, for how long, and the condition of the public service or place visited at that time	Need to use internet network for its use Requires discipline from officers to ensure users report their visits Can only be used for those who have a smartphone
8	**Title:** *Design and Development of Android-Based Tourism Guide Applications in Banyuwangi Mobile Regency* **References:** [18] **Research methods:** *Rapid Application Development* **Result:** To support the need for a tourism information system in Banyuwangi Regency, an Android-based application has been created. An application on a compatible Android smartphone traveler needs to be equipped with attractive features. This application contains information about tourist objects which are equipped with visual media such as images, videos, and Google Maps facilities that make it easier to find tourist locations that will be addressed by the community and tourists.	Design and build in the form of applications that can keep up with current technological advances	The application has not been realized, it is still in the design and build stage Limited to making it easier for tourists to find information about tourism in Banyuwangi It is based on Android, so it's not yet available on other OS

Table 1: Continued.

No	Research Article Description	Advantages	Disadvantages
9	**Title:** *Utilization of QR Code for Recording Student Attendance Data Integrated with the School Management Information System of SMK Mahardika Malang* **References:** [19] **Research methods:** *Rapid Application Development* **Result:** Recording student attendance with this QR code provides several advantages to its users. Student Attendance Recorder with this QR code can be integrated with the school management information system which consists of student data, school schedules (each student subject), a list of student absences, student attendance recap, and an important announcement center for students. So with this integration, the system will provide more benefits for all parties, both for student guardians and SMK Mahardika Malang.	Using a simple system, namely QR Code Student Attendance Recorder with this QR code can be integrated with the school management information system which consists of student data, school schedules (each student subject), a list of student absences, student attendance recap, and an important announcement center for students	Requires population data from the data to be processed, for example in this study is population data from students
10	**Title:** *Usability Evaluation of the Banyuwangi Tourism Application Using the System Usability Scale Method* **References:** [20] **Research methods:** *Usability Scale Method* **Result:** This study aims to evaluate the usability of the Banyuwangi Tourism application. The results show that the Banyuwangi Tourism application can be accepted by users based on its usability aspect. However, improving the quality of the application is still needed, because the usability score also indicates that the quality of the application is still in grade D. This means that the quality of the application usability is quite good but some improvements are still needed. Evaluation to improve the quality of the application can be started by improving the error and satisfaction aspects of the usability of the Banyuwangi Tourism application.	Banyuwangi already has an application dedicated to Banyuwangi tourism information To provide complete information about Banyuwangi tourism, starting from festival schedules, availability of tourist attractions, hotels, tour packages, etc.	There are no specific tools to determine the presence of tourists, so there is no data on the number of tourist arrivals Still limited to an application for purchasing tickets and information about Banyuwangi tourism There needs to be more improvement because the results from Usability are still at grade D

In the Medium Term Development Plan (RPJMD) for Banyuwangi Regency for 2021-2026, priority development programs in the Tourism Sector include the Tourism Marketing Program with performance indicators in the form of growth in the number of

foreign tourists and domestic tourists. Meanwhile, priority development programs in the Communication and Informatics Sector include the Informatics Application Program. These two priority programs can be realized by making an informatics application program that can accurately calculate and record tourist visits to Banyuwangi Regency.

The Banyuwangi Regency Government through the Tourism and Culture Office has launched two informatics applications, namely the “Banyuwangi Tourism” application which can be accessed by tourists and contains information about tourism in Banyuwangi Regency and the “Banyuwangi E-Ticketing” application which can be used by managers of tourist attractions to assist in recording tourist visits and issuing e-tickets to enter tourist attractions. This shows that the Government of Banyuwangi Regency has attempted to create an application to realize a tourism marketing program and facilitate data collection on tourist visits.

To minimize data collection on the number of repeated tourist visits at each tourist attraction visited, the two applications can be integrated and developed further by adapting the results of previous research [13, 14, 17] implemented integrated payment through the QR Code where the Banyuwangi Tourism application can also function as a payment medium to scan barcodes provided in the Tourist Attraction manager through the “E-Ticketing Banyuwangi” application. So tourist profile information using the “Banyuwangi Tourism” application can also be recorded on payment information in the barcode on the “Banyuwangi E-Ticketing” application provided by the manager of Tourist Attractions. Furthermore, in reporting the number of visits from each tourist attraction manager, tourist profiles can be seen through barcode scan transactions to minimize counting the number of repeated tourist visits from each tourist attraction visited by tourists.

5. Conclusion

The Banyuwangi Regency Government has attempted to create informatics applications to realize tourism marketing programs and facilitate data collection of tourist visits, namely the “Banyuwangi Tourism” and “Banyuwangi E-Ticketing” applications. These two applications have not been designed to be able to minimize the occurrence of repeated counting of the number of tourist visits. To minimize data collection on the number of repeated tourist visits at each tourist attraction, these two applications can be integrated and developed further by implementing integrated payment via QR Code where the Banyuwangi Tourism application can also function as a payment medium

to scan barcodes provided in the management of Tourist Attractions through the “E-Ticketing Banyuwangi” application.

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